

```

NNN      NNN      EEEEEEEEEEEEEEE  TTTTTTTTTTTTTTT  AAAAAAAAAAA  CCCCCCCCCCCC  PPPPPPPPPPPP
NNN      NNN      EEEEEEEEEEEEEEE  TTTTTTTTTTTTTTT  AAAAAAAAAAA  CCCCCCCCCCCC  PPPPPPPPPPPP
NNN      NNN      EEEEEEEEEEEEEEE  TTTTTTTTTTTTTTT  AAAAAAAAAAA  CCCCCCCCCCCC  PPPPPPPPPPPP
NNN      NNN      EEE              TTT              AAA              AAA  CCC              PPP              PPP
NNN      NNN      EEE              TTT              AAA              AAA  CCC              PPP              PPP
NNN      NNN      EEE              TTT              AAA              AAA  CCC              PPP              PPP
NNNNNN   NNN      EEE              TTT              AAA              AAA  CCC              PPP              PPP
NNNNNN   NNN      EEE              TTT              AAA              AAA  CCC              PPP              PPP
NNNNNN   NNN      EEE              TTT              AAA              AAA  CCC              PPP              PPP
NNN      NNN      EEEEEEEEEEEEEEE  TTT              AAA              AAA  CCC              PPPPPPPPPPPP
NNN      NNN      EEEEEEEEEEEEEEE  TTT              AAA              AAA  CCC              PPPPPPPPPPPP
NNN      NNN      EEEEEEEEEEEEEEE  TTT              AAA              AAA  CCC              PPPPPPPPPPPP
NNN      NNN      EEE              TTT              AAA              AAA  CCC              PPP
NNN      NNN      EEE              TTT              AAA              AAA  CCC              PPP
NNN      NNN      EEE              TTT              AAA              AAA  CCC              PPP
NNN      NNN      EEE              TTT              AAA              AAA  CCC              PPP
NNN      NNN      EEE              TTT              AAA              AAA  CCC              PPP
NNN      NNN      EEEEEEEEEEEEEEE  TTT              AAA              AAA  CCCCCCCCCCCC  PPP
NNN      NNN      EEEEEEEEEEEEEEE  TTT              AAA              AAA  CCCCCCCCCCCC  PPP
NNN      NNN      EEEEEEEEEEEEEEE  TTT              AAA              AAA  CCCCCCCCCCCC  PPP

```

```

NN      NN      SSSSSSSS  PPPPPPPP  MM      MM      SSSSSSSS  GGGGGGGG  DDDDDDDD  EEEEEEEEE  FFFFFFFFFF
NN      NN      SSSSSSSS  PPPPPPPP  MM      MM      SSSSSSSS  GGGGGGGG  DDDDDDDD  EEEEEEEEE  FFFFFFFFFF
NN      NN      SS      PP      PP  MMMM  MMMM  SS      SS      GG      DD      DD  EE      FF
NN      NN      SS      PP      PP  MMMM  MMMM  SS      SS      GG      DD      DD  EE      FF
NNNN    NN      SS      PP      PP  MM      MM      SS      SS      GG      DD      DD  EE      FF
NNNN    NN      SS      PP      PP  MM      MM      SS      SS      GG      DD      DD  EE      FF
NN      NN      SSSSSS  PPPPPPPP  MM      MM      SSSSSS  GG      GG      DD      DD  EEEEEEE  FFFFFFFF
NN      NN      SSSSSS  PPPPPPPP  MM      MM      SSSSSS  GG      GG      DD      DD  EEEEEEE  FFFFFFFF
NN      NNNN      SS      PP      MM      MM      SS      SS      GG      GG      DD      DD  EE      FF
NN      NNNN      SS      PP      MM      MM      SS      SS      GG      GG      DD      DD  EE      FF
NN      NN      SS      PP      MM      MM      SS      SS      GG      GG      DD      DD  EE      FF
NN      NN      SSSSSSSS  PP      MM      MM      SSSSSSSS  GGGGGG  DDDDDDDD  EEEEEEEEE  FF
NN      NN      SSSSSSSS  PP      MM      MM      SSSSSSSS  GGGGGG  DDDDDDDD  EEEEEEEEE  FF

```



```

SSSSSSSS  DDDDDDDD  LL
SSSSSSSS  DDDDDDDD  LL
SS      DD      DD  LL
SS      DD      DD  LL
SS      DD      DD  LL
SS      DD      DD  LL
SSSSSS  DD      DD  LL
SSSSSS  DD      DD  LL
SS      DD      DD  LL
SS      DD      DD  LL
SS      DD      DD  LL
SS      DD      DD  LL
SSSSSSSS  DDDDDDDD  LLLLLLLLLL
SSSSSSSS  DDDDDDDD  LLLLLLLLLL

```


MODULE \$nspmsgdef

NSPMSGDEF.SDL - NSP and Transport Message Definitions
Version 'V04-000'

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AUTHOR: Alan D. Eldridge 1-April-1982

MODIFIED BY:

V03-005 RNG0004 Rod N. Gamache 19-Nov-1982
Change ENDNODE format messages to LONG format
messages. Change RTS bit definitions in LONG format
messages to be in the flags byte, rather than the
service class.

V03-004 RNG0003 Rod N. Gamache 11-Oct-1982
Add Phase IV Level 2 router definitions

V03-C03 RNG0002 Rod N. Gamache 29-Sep-1982
Add Phase IV endnode definitions

V03-001 RNG0001 Rod N. Gamache 14-Jul-1982
Add Phase IV transport definitions

{++

A thumbnail sketch of the NSP message formats is as follows:

<0eb0 0000><4b_LINK><2b_ACK><2b_SEG><DATA>	DATA MSG
<0011 0000><4b_LINK><2b_ACK><2b_SEG><u16_DATA>	INT. MSG
<0001 0000><4b_LINK><2b_ACK><2b_SEG><2b_FLOW>	L.S. MSG

<0000 0100><4b_LINK><2b_ACK>	DATA ACK
<0001 0100><4b_LINK><2b_ACK>	OTH. ACK
<0010 0100><2b_DST>	CA

<0001 1000><2k_0><2b_SRC><1b_SRV><1b_INFO><2b_SEGSIZ><CTL>	CI
<0010 1000><4b_LINK><2b_SRV><2b_INFO><2b_SEGSIZ><i16_DATA>	CC
<0011 1000><4b_LINK><2b_REA><i16_DATA>	DI
<0100 1000><4b_LINK><2b_REA>	DC
<0100 1000><2b_DST><2k_0><2k_1>	CT
<0100 1000><4b_LINK><2k_42>	DT
<0100 1000><4b_LINK><2k_41>	NLT

<0101 1000>-----	START
------------------	-------

<4b_LINK	::=	<2b_DST><2b_SRC>	link address, not = 0
<2b_ACK	::=	<1001><12 bit seg number>	if NAK
		<1000><12 bit seg number>	if ACK
<2b_SEG>	::=	<0000><12 bit seg number>	
<2b_FLOW>	::=	<0000><2 bit subchannel><2 bit mode><1 byte count>	
		0 => data	00 => no change
		1 => interrupt	01 => stop
			10 => start

<1b_SRV>	::=	<00000001>	if no flow control
		<00000101>	if segment flow control
		<00001001>	if message flow control
<1b_INFO>	::=	<00000001>	if NSP V3.1
		<00000000>	if NSP V3.2

<CTL>	::=	<DNAME><SNAME><00vv00da><ACCOUNT><i16_DATA>
		if a if d
		vv = Session control version
		0 = Version 1.0
		All other are reserved
		<DNAME> ::= <NAME>
		<SNAME> ::= <NAME>
		<NAME> ::= <1k_0><1b_objtyp> objtyp not= 0
		<1k_1><1k_0><i16_desc>
		<1k_2><1k_0><2b_gcod><2b_ucod><i12_desc>
		<ACCT> ::= <i39_id><i39_psw><i39_acc>

```
--
AGGREGATE nspmsg STRUCTURE PREFIX nsp$ TAG $$;
```

{


```
{
{ Define message codes -- first byte of message
{
```

```
CONSTANT msg_ci    EQUALS %x18 TAG c;    { Connect Initiate
CONSTANT msg_ca    EQUALS %x24 TAG c;    { Connect Acknowledge
CONSTANT msg_cc    EQUALS %x28 TAG c;    { Connect Confirm
CONSTANT msg_data  EQUALS %x00 TAG c;    { Data
CONSTANT msg_int   EQUALS %x30 TAG c;    { Interrupt
CONSTANT msg_ls    EQUALS %x10 TAG c;    { Link Service
CONSTANT msg_liack EQUALS %x14 TAG c;    { LS/INT Ack
CONSTANT msg_dtack  EQUALS %x04 TAG c;    { Data ACK
CONSTANT msg_di    EQUALS %x38 TAG c;    { Disconnect Initiate
CONSTANT msg_dc    EQUALS %x48 TAG c;    { Disconnect Confirm
{
```

```
{
{ Define maximum message header sizes
{
```

```
CONSTANT hsz_ci    EQUALS 240 TAG c;    {&Connect Initiate
CONSTANT hsz_ca    EQUALS 3 TAG c;      { Connect Acknowledge
CONSTANT hsz_cc    EQUALS 100 TAG c;    {&Connect Confirm
CONSTANT hsz_data  EQUALS 9 TAG c;      { Data
CONSTANT hsz_int   EQUALS 9 TAG c;      { Interrupt
CONSTANT hsz_ls    EQUALS 9 TAG c;      { Link Service
CONSTANT hsz_ack   EQUALS 7 TAG c;      { LS/INT or Data Ack
CONSTANT hsz_di    EQUALS 22 TAG c;    { Disconnect Initiate
CONSTANT hsz_dc    EQUALS 22 TAG c;    { Disconnect Confirm
CONSTANT hsz_cd    EQUALS 240 TAG c;    {&Maximum of all connect
                                         { or disconnect messages
{
```

```
qual      UNION;
```

```
qual_msg   STRUCTURE TAG $$;
msg_sp1    BITFIELD LENGTH 4;
msg_li     BITFIELD MASK;
msg_int    BITFIELD MASK;
dstlnk     WORD;
srclnk     WORD;
END qual_msg;
{ Miscellaneous message fields
{ Misc. MSG field qualifiers
{ Skip constant part of field
{ Set if not DATA subchannel msg
{ Set if INT rather than LS msg
{ Destination link address
{ Source link address
{
```

```
qual_data  STRUCTURE TAG $$;
data_sp    BITFIELD LENGTH 5;
data_bom   BITFIELD MASK;
data_eom   BITFIELD MASK;
data_ovfw  BITFIELD MASK;
END qual_data;
{ Qualifiers to NSP$C_MSG_DATA
{ Skip constant part of field
{ Set if first seg in message
{ Set if last seg in message
{ Set if no further segs could
{ be buffered without overflow
{ of the session ctl buffer -
{ INTERNAL ONLY, not in NSP
{
```

```
qual_ack   STRUCTURE TAG $$;
ack_num    BITFIELD MASK LENGTH 12;
ack_nak    BITFIELD MASK;
ack_sp2    BITFIELD LENGTH 2;
ack_valid  BITFIELD MASK;
{ Qualifiers to all ACK fields
{ Seg number being ACK'd
{ Set if this is a NAK
{ Skip reserved field
{ Set to identify field as an
```

```

END qual_ack;
qual_srv    STRUCTURE TAG $$;
    srv_01   BITFIELD MASK LENGTH 2;
    srv_flw  BITFIELD MASK LENGTH 2;
    CONSTANT srv_nfc  EQUALS 0 TAG c;
    CONSTANT srv_sfc  EQUALS 1 TAG c;
    CONSTANT srv_mfc  EQUALS 2 TAG c;
    srv_sp1   BITFIELD MASK LENGTH 3;
    srv_ext   BITFIELD MASK;
    CONSTANT  srv_req  EQUALS %B11110011 TAG m;
    CONSTANT  srv_req  EQUALS %B00000001 TAG c;
END qual_srv;
qual_inf    STRUCTURE TAG $$;
    inf_ver   BITFIELD MASK LENGTH 2;
    CONSTANT  inf_v32  EQUALS 0 TAG c;
    CONSTANT  inf_v31  EQUALS 1 TAG c;
    CONSTANT  inf_v33  EQUALS 2 TAG c;
END qual_inf;
qual_flw    STRUCTURE TAG $$;
    flw_mode  BITFIELD MASK LENGTH 2;
    CONSTANT  flw_nop  EQUALS 0 TAG c;
    CONSTANT  flw_xoff EQUALS 1 TAG c;
    CONSTANT  flw_xon  EQUALS 2 TAG c;
    flw_chan  BITFIELD MASK LENGTH 2;
    CONSTANT  flw_data EQUALS 0 TAG c;
    CONSTANT  flw_int  EQUALS 1 TAG c;
    flw_drv   BITFIELD MASK LENGTH 4;
END qual_flw;
qual_altflw STRUCTURE TAG $$;
{
{ These flags define the LSFLAGS in an alternate way to "qual_flw"
{ above. It depicts the same information, but takes advantage of
{ the fact that not all values of the 2-bit fields are used and hence
{ 1-bit flags can be used rather than constants.
{
{ The first 4 bits are part of NSP. The last 4 bits are Netdriver
{ internal flags.
{
    flw_xoff  BITFIELD MASK LENGTH 1;
    flw_xon   BITFIELD MASK LENGTH 1;

```

```

{ ACK and not just a segment #
{
{ Qualifiers to SERVICES field
{ in CI and CC messages
{ Must be value "01"
{ Receiver's flow control mode
{ no flow control
{ segment flow control
{ message flow control
{ Reserved bits
{ Set if field extends to next
{ byte
{ Mask of SERVICE bits which
{ must have a known value
{ ...that known value
{
{
{ Qualifiers to INFO field in
{ CI and CC messages
{ NSP version number
{ Version 3.2
{ Version 3.1
{ Version 3.3
{ "3" is reserved
{
{
{ Link Service message LSFLAGS
{ field definition
{ Back-pressure value field
{ no-change
{ stop flow
{ start flow
{ "3" is reserved
{ Sub channel selector
{ Data subchannel
{ Interrupt subchannel
{ "2" and "3" are reserved
{ Define the remainder of the
{ field for Netdriver internal
{ flags
{
{
{ Alternate Link Service
{ message LSFLAGS

```

```

{ Stop flow on DATA subchannel
{ Start

```


flw_lisub	BITFIELD	MASK	LENGTH 1;	{ Flow control count is for the
				{ Link Service/Interrupt, and
				{ not the DATA, subchannel
flw_sp1	BITFIELD	MASK	LENGTH 1;	{ Spare
flw_inuse	BITFIELD	MASK	LENGTH 1;	{ XWBSB_X_FLW is in use
flw_int	BITFIELD	MASK	LENGTH 1;	{ XWBSB_X_FLW describes an
				{ "Interrupt", not a "Link-
				{ Service", message
flw_sp2	BITFIELD	MASK	LENGTH 1;	{ Spare
flw_sp3	BITFIELD	MASK	LENGTH 1;	{ Spare
END qual_altflw;				{

END qual;

END nspmsg ;

Phase III Routing Message Definitions

The following is a thumbnail sketch of the possibilities for the first byte in a received message:

<0000 1000>	Phase II NOP
<0101 1000>	Phase II Start
<0100 xx10>	Phase II route header
<000x x010>	Phase III route header
<000x x010>	Phase IV non-broadcast circuit route header
<00xx 0x10>	Phase IV broadcast circuit route header
<0000 0001>	Phase III init
<0000 0011>	Phase III verification
<0000 0101>	Phase III hello message
<0000 0111>	Phase III routing message
<0000 1001>	Phase IV Level 2 routing message
<0000 1011>	Phase IV broadcast circuit Router hello message
<0000 1101>	Phase IV broadcast circuit Endnode hello message

```
AGGREGATE tr3msg STRUCTURE PREFIX tr3$ TAG $$;
```

```
{
{ Define message codes -- first byte of message (DECnet calls these
{ "control flags")
{
```

```
CONSTANT msg_init EQUALS %x01 TAG c; { "Initialization" message
CONSTANT msg_verf EQUALS %x03 TAG c; { "Verification" message
CONSTANT msg_hello EQUALS %x05 TAG c; { "Hello" message
CONSTANT msg_rout EQUALS %x07 TAG c; { "Routing" message
CONSTANT msg_data EQUALS %x02 TAG c; { Normal route-thru message
{ (without qualifiers)
CONSTANT msg_str2 EQUALS %x58 TAG c; { Phase II "Start" message
CONSTANT msg_nop2 EQUALS %x08 TAG c; { Phase II "Nop" message
```

```
{
{ Define message header sizes where applicable
{
```

```
CONSTANT hsz_data EQUALS 6 TAG c; { Normal route-thru message
```

```
{
{ Define qualifiers to the various message codes
```



```

{
{
qual      UNION;

qual_msg  STRUCTURE TAG $$;
msg_ctl   BITFIELD  MASK LENGTH 1;
msg_rth   BITFIELD  MASK LENGTH 1;

end qual_msg;

qual_rtflg STRUCTURE TAG $$;
rtflg_012 BITFIELD  LENGTH 3;
rtflg_rqr BITFIELD  MASK LENGTH 1;
rtflg_rts BITFIELD  MASK LENGTH 1;
rtflg_5   BITFIELD  MASK LENGTH 1;
rtflg_ph2 BITFIELD  MASK LENGTH 1;
rtflg_7   BITFIELD  MASK LENGTH 1;
END qual_rtflg;

END qual;

END tr3msg;

```

```

{ Miscellaneous message fields
{ Common qualifiers
{ Set on Phase III control msgs
{ - clear on all other messages
{ Set if a Phase II or III
{ route-header, clear if a
{ Phase II control message
{
{ Route-header qualifiers
{ Must have the value 010
{ Set if "return-to-sender" on
{ error is requested
{ Set if message is being
{ "returned-to-sender"
{ Must be clear
{ Set if Phase II route-header
{ Must be clear

```

Phase IV Routing Message Definitions

The following is a thumbnail sketch of the possibilities for the first byte in a received message:

<000x x010>	Phase IV non-broadcast circuit route header
<00xx 0x10>	Phase IV broadcast circuit route header
<0000 1001>	Phase IV Level 2 routing message
<0000 1011>	Phase IV broadcast circuit Router hello message
<0000 1101>	Phase IV broadcast circuit Endnode hello message

AGGREGATE tr4msg STRUCTURE PREFIX tr4\$ TAG \$\$;

Define message codes -- first byte of message (DECnet calls these "control flags")

CONSTANT msg_bcrhel	EQUALS %xB TAG c;	{ Broadcast Circuit Router
		{ "Hello" message
CONSTANT msg_bcehel	EQUALS %xD TAG c;	{ Broadcast Circuit Endnode
		{ "Hello" message
		{ (without qualifiers)
CONSTANT msg_rdata	EQUALS %x02 TAG c;	{ Normal route-thru message
CONSTANT msg_ldata	EQUALS %x06 TAG c;	{ Long header data message

Define constants

CONSTANT T3MULT	EQUALS %x2 TAG c;	{ T3 multiplier
CONSTANT BCT3MULT	EQUALS %x8 TAG c;	{ Broadcast Circuit T3
		{ multiplier
CONSTANT VER_LOWW	EQUALS %x0002 TAG c;	{ Transport's version number
CONSTANT VER_HIB	EQUALS %x00 TAG c;	{ V2.0.0
CONSTANT HIORD	EQUALS %x000400AA TAG c;	{ HIORD part of node address
CONSTANT RTR_LVL1	EQUALS %x2 TAG c;	{ Level 1 router type code
CONSTANT RTR_LVL2	EQUALS %x1 TAG c;	{ Level 2 router type code
CONSTANT END_NODE	EQUALS %x3 TAG c;	{ Endnode type code
CONSTANT BCR_MID1	EQUALS %x030000AB TAG c;	{ Broadcast circuit router's
CONSTANT BCR_MID2	EQUALS %x0 TAG c;	{ multicast ID
CONSTANT BCE_MID1	EQUALS %x040000AB TAG c;	{ Broadcast circuit endnode's
CONSTANT BCE_MID2	EQUALS %x0 TAG c;	{ multicast ID
CONSTANT PRO_TYPE	EQUALS %x0360 TAG c;	{ Transports protocol type


```

{ Define message header sizes where applicable
{
{
CONSTANT hsz_data EQUALS 21 TAG c; { BC Endnode route-thru message
{
{ Define qualifiers to message codes
{
qual UNION; { Miscellaneous message fields
    qual_rtflg STRUCTURE TAG $$; { Long Route-header
        { qualifiers
        rtflg_01 BITFIELD LENGTH 2; { Must have the value 10
        rtflg_lng BITFIELD MASK LENGTH 1; { Set if Long format message
        rtflg_rqr BITFIELD MASK LENGTH 1; { Set if return-to-sender requested
        rtflg_rts BITFIELD MASK LENGTH 1; { Set if message is being
        { "returned-to-sender"
        rtflg_ini BITFIELD MASK LENGTH 1; { Set if Intra-NI message
        { (on route-thru messages)
        rtflg_ver BITFIELD LENGTH 2; { Route header version number
        END qual_rtflg;

    qual_sclass STRUCTURE TAG $$; { Long format SERVICE CLASS
        { qualifiers
        sclass_metr BITFIELD LENGTH 1; { Metric - RESERVED
        sclass_1 BITFIELD LENGTH 1; { Must be clear - RESERVED
        sclass_ls BITFIELD LENGTH 1; { Load splitting - RESERVED
        sclass_suba BITFIELD LENGTH 1; { Sub Area - RESERVED
        sclass_bc BITFIELD LENGTH 1; { Broadcast - RESERVED
        sclass_57 BITFIELD LENGTH 3; { Must be clear - RESERVED
        END qual_sclass;

    qual_addr STRUCTURE TAG $$; { Node address qualifiers
        addr_dest BITFIELD MASK LENGTH 10; { Destination address field
        addr_area BITFIELD MASK LENGTH 6; { Area part of node address
        END qual_addr;

    END qual;

    END tr4msg;

END_MODULE $nspmsgdef ;

```


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